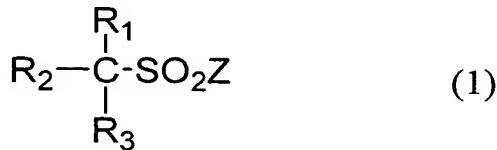


CLAIMS

1. A method for producing a fluorine-containing halide, comprising reacting a fluorine-containing sulfonyl halide with a 5 metal halide in the presence or absence of a solvent,

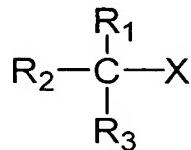
the fluorine-containing sulfonyl halide being represented by general formula (1):



wherein R^1 , R^2 and R^3 are the same or different, each representing 10 a halogen atom, a hydrogen atom or a monovalent hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms; at least one of R^1 , R^2 and R^3 is a halogen atom; Z is Cl or F; provided that when 15 none of R^1 , R^2 and R^3 is a fluorine atom, at least one of R^1 , R^2 and R^3 is a monovalent fluorine-containing hydrocarbon group, and when Z is F, R_1 and R_3 are both fluorine atoms and R_2 is a $CF_2=CFOCF_2^-$ group;

the metal halide being represented by general formula M^1X , wherein M^1 is Ma or $(Mb)_{1/2}$, Ma being an alkali metal, Mb 20 being an alkaline earth metal, and X being Br or I;

the fluorine-containing halide being represented by the general formula shown below:



wherein R_1 , R_2 , R_3 and X are the same as above.

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2. The method for producing a fluorine-containing halide according to claim 1, wherein the fluorine-containing sulfonyl halide represented by general formula (1) is a compound represented by general formula (1a):



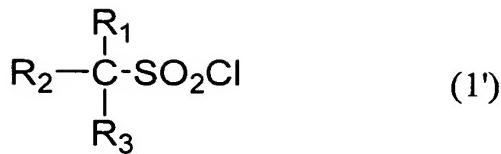
wherein R^4 is a halogen atom, a hydrogen atom or a monovalent hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms.

3. The method for producing a fluorine-containing halide according to claim 1, wherein the fluorine-containing sulfonyl halide represented by general formula (1) is a compound
10 represented by general formula $Y(CF_2)_n-SO_2Cl$ wherein Y is a halogen atom, $-SO_2F$ or $-CCl_3$, and n is an integer from 1 to 9; a compound represented by general formula
 $CF_2=CF(CF_2)_e(OCF_2CF(CF_3))_gO(CF_2)_h-SO_2Cl$ wherein e is an integer from 0 to 2, g is an integer from 0 to 3, and h is an integer from 1
15 to 6; or a compound represented by general formula
 $CF_2=CFOCF_2CF_2SO_2F$.

4. The method according to claim 1, wherein the metal halide represented by chemical formula M^1X is an alkali metal
20 bromide or alkali metal iodide.

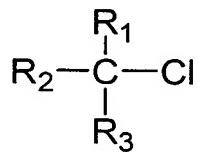
5. The method according to claim 1, wherein the reaction is carried out in a polar solvent.

25 6. A method for producing a fluorine-containing chloride, comprising reacting a fluorine-containing sulfonyl chloride in the presence or absence of a solvent with at least one member selected from the group consisting of metals belonging to periods 4 to 7 of groups 3 to 16 in the periodic table and
30 compounds containing any of such metals,
the fluorine-containing sulfonyl chloride being represented by general formula (1'):



wherein R^1 , R^2 and R^3 are the same or different, each representing a halogen atom, a hydrogen atom or a monovalent hydrocarbon group which may contain one or more atoms of one or more kinds selected
5 from fluorine, oxygen, nitrogen and sulfur atoms; and at least one of R^1 , R^2 and R^3 is a halogen atom; provided that when none of R^1 , R^2 and R^3 is a fluorine atom, at least one of R^1 , R^2 and R^3 is a monovalent fluorine-containing hydrocarbon group;

the fluorine-containing chloride being represented by
10 the general formula shown below:



wherein R^1 , R^2 and R^3 are the same as above.

7. The method for producing a fluorine-containing
15 chloride according to claim 6, wherein the fluorine-containing sulfonyl chloride represented by general formula (1') is a compound represented by general formula (1a):



wherein R^4 is a halogen atom, a hydrogen atom or a monovalent
20 hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms.

8. The method for producing a fluorine-containing
25 chloride according to claim 6, wherein the fluorine-containing sulfonyl chloride represented by general formula (1') is a compound represented by general formula $Y(CF_2)_n-SO_2Cl$ wherein Y is a halogen atom, $-SO_2F$ or $-CCl_3$, and n is an integer from 1 to 9; or a compound represented by general formula

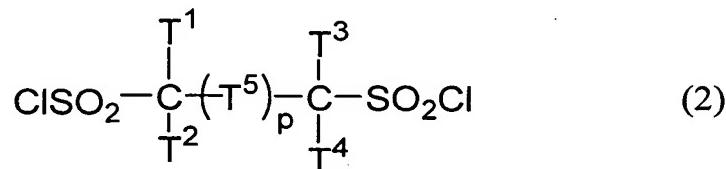
CF₂=CF(CF₂)_e(OCF₂CF(CF₃)_gO(CF₂)_h-SO₂Cl wherein e is an integer from 0 to 2, g is an integer from 0 to 3, and h is an integer from 1 to 6.

5 9. The method according to claim 6, wherein the metals belonging to periods 4 to 7 of groups 3 to 16 in the periodic table are Cu, Pt, Pd, Ni, Zn and Fe, and the compounds containing any of metals belonging to periods 4 to 7 of groups 3 to 16 in the periodic table are compounds containing Cu, Fe, Ni, Co, Pd, 10 Ti or Pb as a metal component.

10. The method according to claim 6, wherein the reaction is carried out in a polar solvent.

15 11. A method for producing a fluorine-containing halide, comprising reacting a fluorine-containing disulfonyl chloride with a metal halide in the presence or absence of a solvent,

20 the fluorine-containing disulfonyl chloride being represented by general formula (2):

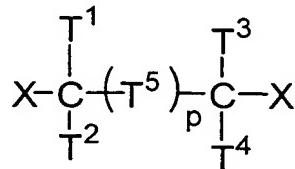


25 wherein T¹, T², T³ and T⁴ are the same or different, each representing a halogen atom, a hydrogen atom or a monovalent hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms; at least one of T¹, T², T³ and T⁴ is a halogen atom; T⁵ is a bivalent hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms; and p is 0 or 1; provided that at least one of T¹ and T² is a monovalent fluorine-containing hydrocarbon group when neither T¹ nor T² is a fluorine atom, and at least one of T³ and T⁴ is a monovalent fluorine-containing hydrocarbon group when

neither T³ nor T⁴ is a fluorine atom;

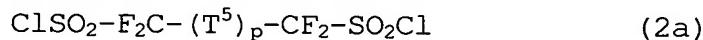
the metal halide being represented by general formula M¹X, wherein M¹ is Ma or (Mb)_{1/2}, Ma being an alkali metal, Mb being an alkaline earth metal, and X being Br or I;

5 the fluorine-containing halide being represented by general formula shown below:



wherein T¹, T², T³, T⁴, T⁵, X and p are the same as above.

10 12. The method for producing a fluorine-containing halide according to claim 11, wherein the fluorine-containing disulfonyl chloride represented by general formula (2) is a compound represented by general formula (2a):



15 wherein T⁵ is a bivalent hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms; and p is 0 or 1.

20 13. The method for producing a fluorine-containing halide according to claim 11, wherein the fluorine-containing disulfonyl chloride represented by general formula (2) is a compound represented by general formula ClSO₂(CF₂)_pSO₂Cl, wherein p is an integer from 2 to 9.

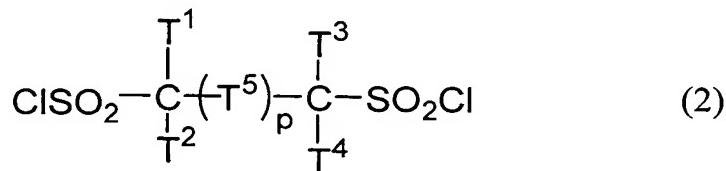
25 14. The method according to claim 11, wherein the metal halide represented by chemical formula M¹X is an alkali metal bromide or alkali metal iodide.

30 15. The method according to claim 11, wherein the reaction is carried out in a polar solvent.

16. A method for producing a fluorine-containing

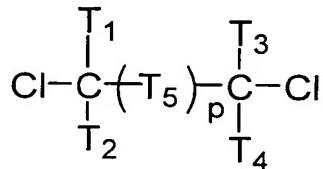
chloride, comprising reacting a fluorine-containing disulfonyl chloride in the presence or absence of a solvent with at least one member selected from the group consisting of metals belonging to periods 4 to 7 of groups 3 to 16 in the periodic table and
5 compounds containing any of such metals,

the fluorine-containing disulfonyl chloride being represented by general formula (2):



wherein T^1 , T^2 , T^3 and T^4 are the same or different, each
10 representing a halogen atom, a hydrogen atom or a monovalent hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms; at least one of T^1 , T^2 , T^3 and T^4 is a halogen atom; T^5 is a bivalent hydrocarbon group which may contain one or more atoms of
15 one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms; and p is 0 or 1; provided that at least one of T^1 and T^2 is a monovalent fluorine-containing hydrocarbon group when neither T^1 nor T^2 is a fluorine atom, and at least one of T^3 and T^4 is a monovalent fluorine-containing hydrocarbon group when
20 neither T^3 nor T^4 is a fluorine atom;

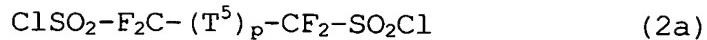
the fluorine-containing chloride being represented by general formula shown below:



wherein T^1 , T^2 , T^3 , T^4 , T^5 and p are the same as above.

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17. The method for producing a fluorine-containing chloride according to claim 16, wherein the fluorine-containing disulfonyl chloride represented by general formula (2) is a compound represented by general formula (2a):



wherein T^5 is a bivalent hydrocarbon group which may contain one or more atoms of one or more kinds selected from fluorine, oxygen, nitrogen and sulfur atoms; and p is 0 or 1.

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18. The method for producing a fluorine-containing chloride according to claim 16, wherein the fluorine-containing disulfonyl chloride represented by general formula (2) is a compound represented by general formula $\text{ClSO}_2(\text{CF}_2)_p\text{SO}_2\text{Cl}$, wherein p 10 is an integer from 2 to 9.

19. The method according to claim 16, wherein the metals belonging to periods 4 to 7 of groups 3 to 16 in the periodic table are Cu, Pt, Pd, Ni, Zn and Fe, and the compounds 15 containing any of metals belonging to periods 4 to 7 of groups 3 to 16 in the periodic table are compounds containing Cu, Fe, Ni, Co, Pd, Ti or Pb as a metal component.

20. The method according to claim 16, wherein the reaction is carried out in a polar solvent.